

Slope: Part 2


Review and Finding the Slope


Slope


Slope

- 📄 indicates the steepness of a line.
- 📄 is “the change in y over the change in x ” (vertical over horizontal).
- 📄 is the ‘ m ’ in $y = mx + b$.

Finding the Slope of a Line



$$m = \frac{\textit{rise}}{\textit{run}}$$

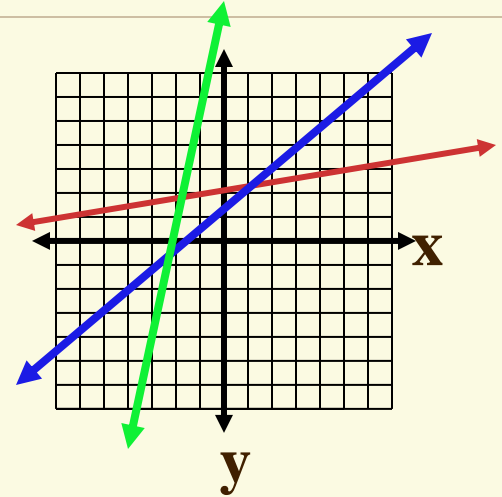

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$




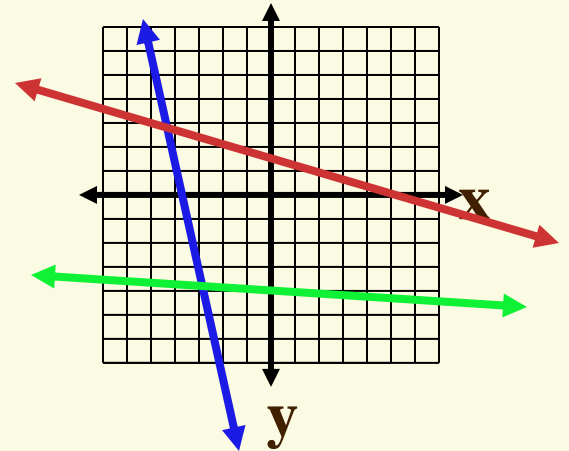
We use the first equation when given a graph, the second when given two points.

Positive & Negative Slopes


 If a line rises from left to right (uphill), it has a **positive** slope.

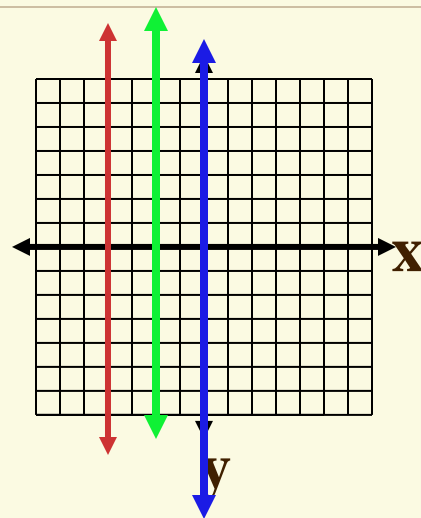



 If a line falls from left to right (downhill), it has a **negative** slope.

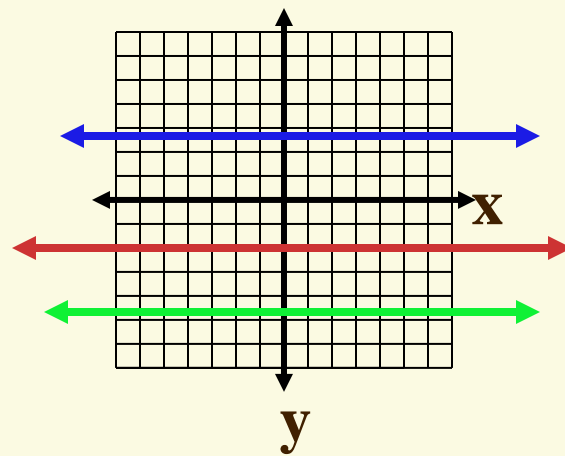


Vertical & Horizontal Slopes

 If a line is vertical, it has an undefined slope.



 If a line is horizontal it has a slope equal to 0.



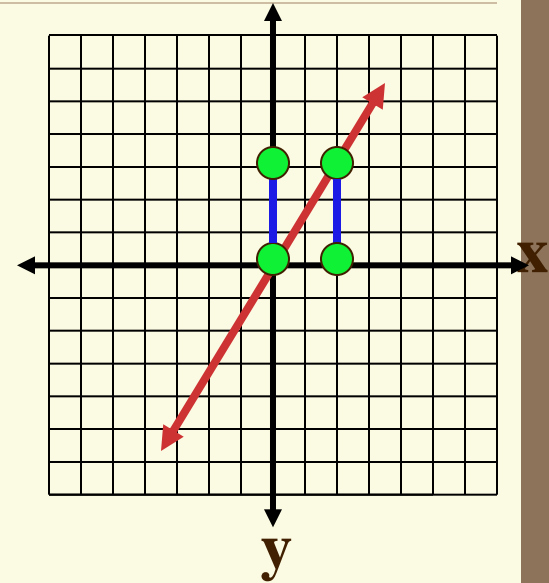
Find the Slope

📄 To find the slope of this line we will use **rise/run**.

📄 Pick either point.

📄 Count up (+) or down (-).

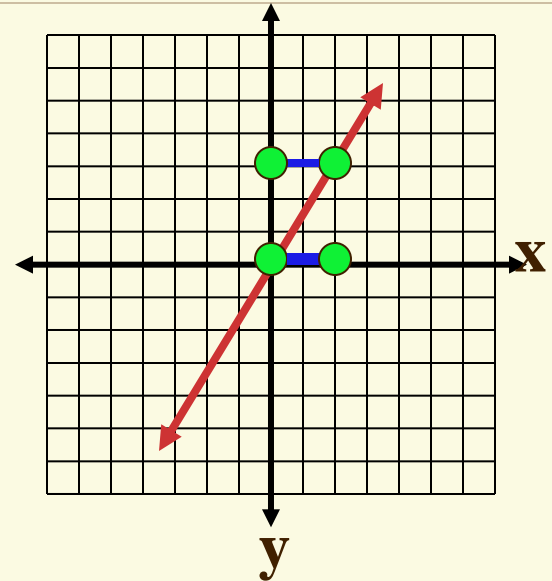
📄 Rise is 3 up from the bottom or -3 down from the top point.



Find the Slope

📄 To find the run, we count right (+) or left (-).

📄 If you started from the top point, your run will be left -2, if you started at the bottom point, your run will be right 2.

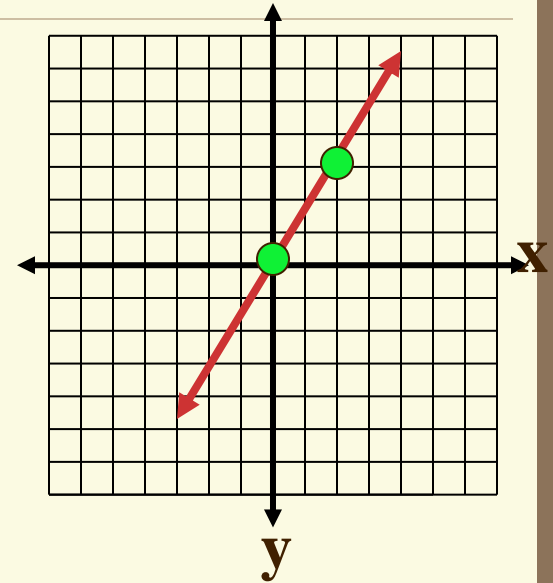


Find the Slope

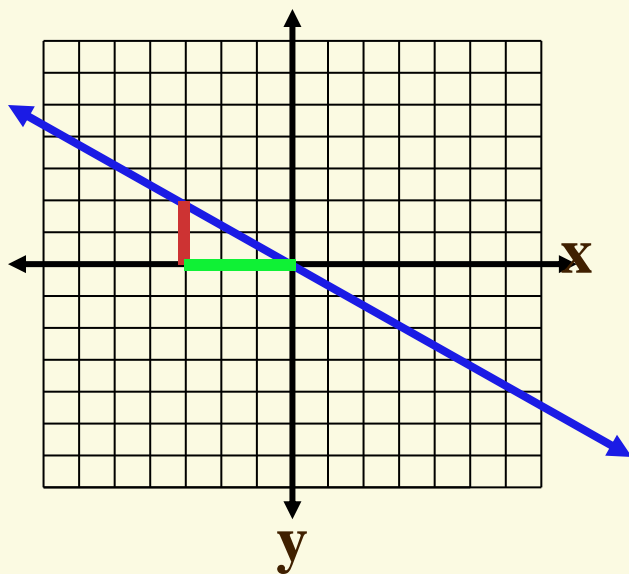
So if you started with the top point, your slope would be $-3/-2$.

If you started with the bottom point, your slope would be $3/2$.

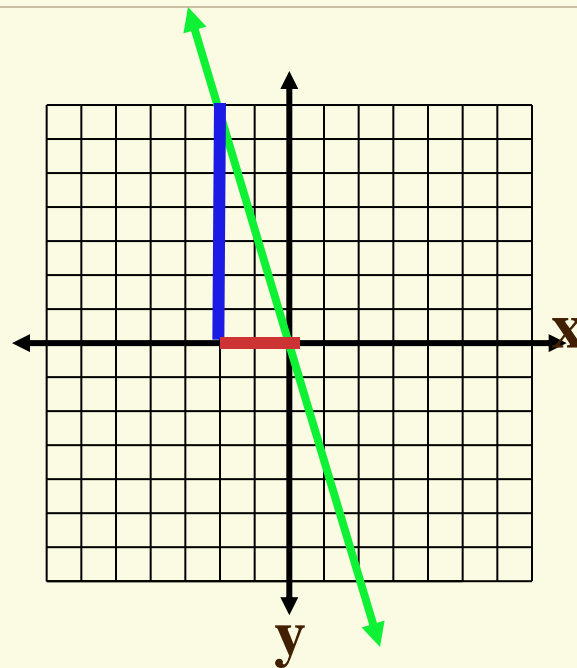
Are these the same? Yes!! The slope of the line is $3/2$.



Find the Slope

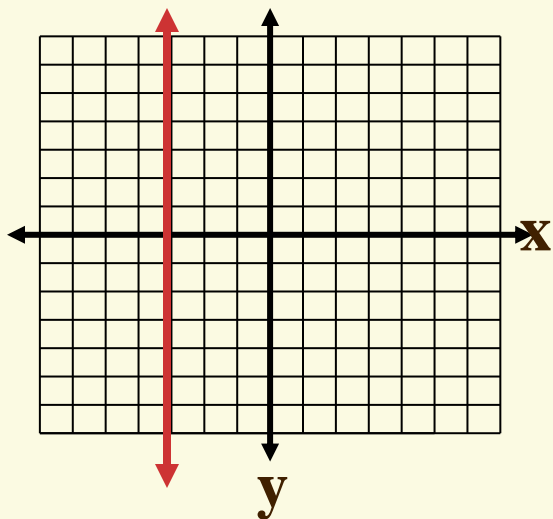


$$m = -\frac{2}{3}$$

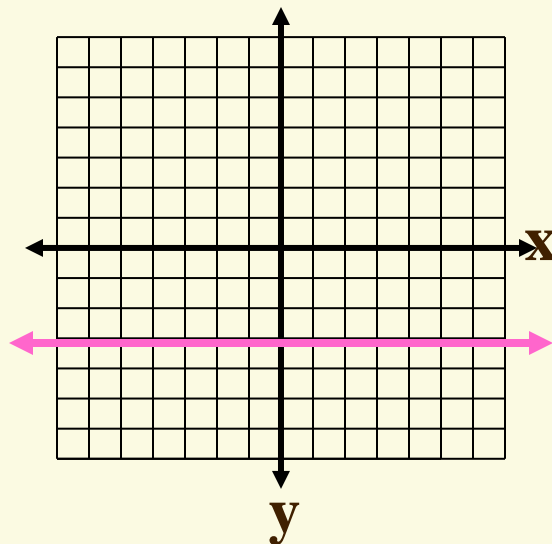



$$m = -\frac{7}{2}$$

Find the Slope




 $m = \text{undefined}$




 $m = 0$

Find the Slope of the Line


 Given the points
(5, 1) & (6, 4)

$$\begin{aligned} m &= \frac{4-1}{6-5} \\ &= \frac{3}{1} = 3 \end{aligned}$$


 Given the points
(-6, -2) & (-1, 0)

$$\begin{aligned} m &= \frac{-2-0}{-6--1} \\ &= \frac{-2}{-6+1} = \frac{-2}{-5} = \frac{2}{5} \end{aligned}$$

Parallel Lines

 What do you know about the slope of parallel lines?

 Parallel lines have the
SAME SLOPE!

 What is the slope of the line parallel to
 $y = -2x + 4$ $m = -2$

Perpendicular Lines

- What do you know about the slope of perpendicular lines?
- Perpendicular lines have slopes that are **opposite reciprocals!**
- What is the slope of the line perpendicular to $y = -2x + 4$? $m = 1/2$

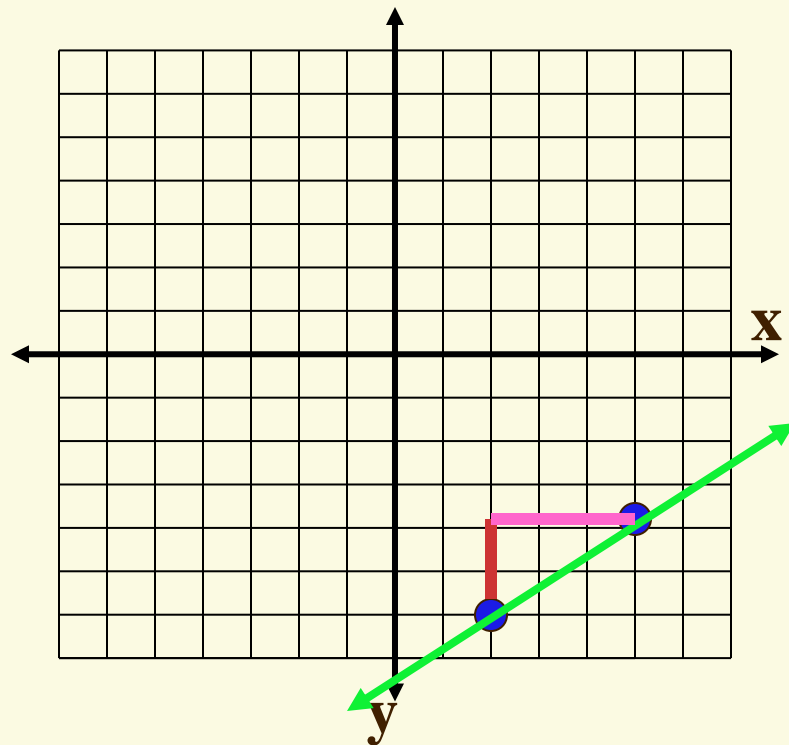
Graphing a Line Given a Point & Slope

Graph a line through the point
 $(2, -6)$ with $m=2/3$


Graph $(2, -6)$


Count up 2 for the
rise, and 3 to the
right for the run


Plot the point, repeat, then connect




Graphing Lines

 Graph the line perpendicular to $y = 2x + 3$ that goes through the point $(-2, 3)$.


 The slope of the line is 2 so the slope of the perpendicular line is $-1/2$.

 $m = -1/2$ $b = 3$

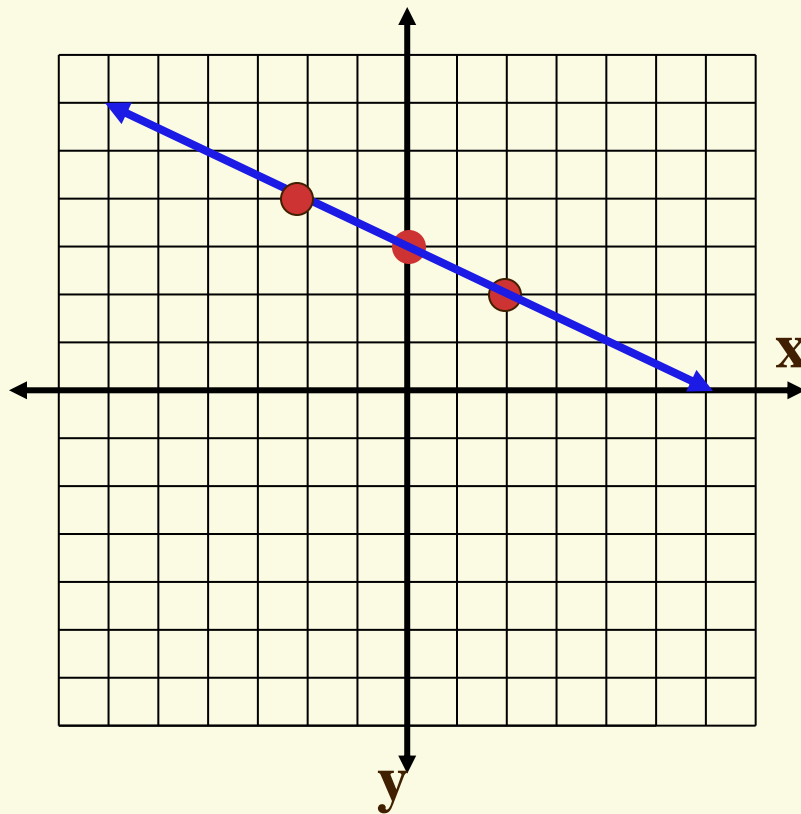
Graphing Lines

 $m = -\frac{1}{2}$ $b = 3$


 Plot y-intercept (b)


 Use the slope to
find two more
points

 Connect




Graphing Lines

 **Graph the line parallel to $x = -1$ that goes through the point $(3, -3)$.**

 **The slope of the line is undefined so the slope of the parallel line is undefined.**

Graph the Line

 **(3, -3) $m = \text{undefined}$**

